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No. 10



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IMPROVED METHOD FOR CLONING HUMAN DIPLOID FIBROBLASTS

Leningrad TSITOLOGIYA in Russian Vol 23, No 6, Jun 81
(manuscript received 6 Feb 80) pp 717-718

TEREKHOV, S. M., Laboratory of Human Cytogenetics, Institute of Medical Genetics, USSR Academy of Medical Sciences, Moscow

[Abstract] The aim of this work was to develop a simple and reproducible method for cloning normal human diploid fibroblasts. This was done by testing eight fibroblast strains of human fibroblasts with various combinations of mediums that included Eagle's medium, F-12, calf embryo serum, bovine serum and human funic serum. Five of the fibroblast strains used were from 8-12-week embryos and three from the skin of adult individuals; they included IMG-777, IMG-795 and IMG-8017. Trypsinization was done at 4°C. No antibiotics were added. Cell suspensions were seeded on 40-mm-diameter Petri dishes and incubated in a moisture-saturated atmosphere containing 3-5 percent carbon dioxide at 37°C. Colonies were examined and fixed in a 10-percent formalin solution and stained with a 0.1-percent solution of methylene blue after 14-18 days. Initial testing was done using the IMG-777 postnatal strain and best results were obtained with either Eagle's medium or F-12 with a mixture of bovine serum and human funic serum. Other strains were then tested to determine which of them was least affected by trypsinization (cell damage). It was found that the embryo strain IMG-795 was best with 80 percent cloning recorded. The decisive factor in success using this method is the use of a mixture of bovine serum and human funic serum. References 5 (Western).
[265-9642]

ANTIBIOTIC SENSITIVITY OF PLAGUE MICROBE STRAINS ISOLATED IN CAUCASUS AND
TRANSCAUCASUS FOCI

Moscow ANTIBIOTIKI in Russian Vol 26, No 5, May 81
(manuscript received 14 Nov 80) pp 365-367

TARASOVA, V. Ye., YEREMITSKAYA, G. N. and PROSKURINA, V. A., Scientific Research
Antiplague Institute of the Caucasus and Transcaucasus, Stavropol'

[Abstract] The effect of 13 antibiotics on 91 strains of plague microbes were tested in serial dilutions in Hottinger's agar. The tested antibiotics included streptomycin, erythromycin, methicillin, gentamicin, tetracycline, levomycetin, monomycin, lincomycin, ristomycin, kanamycin, rifampicin, doxycyclin and polymixin M. All the strains were resistant to polymixin, lincomycin, erythromycin, methicillin and ristomycin, they were moderately sensitive to levomycetin, monomycin, streptomycin and rifampicin and they were highly sensitive to gentamicin, tetracycline, doxycyclin and kanamycin. The strains of microbes also showed different sensitivity to a preparation of the nitrofur series, displaying weak sensitivity to phorastolidone and resistance to dioxidine and quinoxidine. References 4 (Russian).

[233-6521]

RADIAL HEMOLYSIS TEST IN DIAGNOSING TICK-BORNE ENCEPHALITIS

Moscow VOPROSY VIROSOLOGII in Russian No 3, May-Jun 81
(manuscript received 26 Jan 81) pp 347-350

KOKOREV, V. S., PONOMAREV, D. N., KURSAKOVA, A. S., KIPRIYANOVA, N. V. and LAPSHINA, K. A., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow, and the Epidemiologic Stations of Sverdlovskaya and Permskaya Oblasts

[Abstract] Sera from 258 subjects at risk of tick-borne encephalitis were analyzed by radial hemolysis in gel and passive hemagglutination inhibition for the presence of specific antibodies. Comparison of the resultant data involving 464 serum samples yielded the same number of positive subjects (77) and agreement as to antibody levels. Significant advantages of the radial hemolysis test are its specificity, sensitivity, simplicity, and insensitivity to normal serum inhibitors. References 5: 1 Western, 1 East European, 3 Russian.

[317-12172]

MODELS OF PERSISTENT HeLa CELL INFECTIONS BY CLONES OF JAPANESE ENCEPHALITIS VIRUS

Moscow VOPROSY VIRUSOLOGII in Russian No 3, May-Jun 81
(manuscript received 22 Oct 80) pp 332-335

CHEREDNICHENKO, Yu. N. and LOGINOVA, N. V., Institute of Virology
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[Abstract] Conditions are described for infecting HeLa cells with the weakly pathogenic Nakayama and Peking I strains of the Japanese encephalitis virus for purposes of creating a model system for latent viral infections. During a 325 day period of observation, involving 84 subpassages, the system was characterized by predominance of small plaque viral phenotypes on chick embryo cells, lack of cytopathic changes in the HeLa cells, and further attenuation of the pathogenic properties of the Nakayama and Peking I strains. Figures 2; references 14: 5 Western, 9 Russian.
[317-12172]

UDC 578.833.26:578.233.63

MULTIPLD VIRIONS OF VENEZUELAN EQUINE ENCEPHALOMYELITIS VIRUS: ISOLATION AND PROPERTIES

Moscow VOPROSY VIRUSOLOGII in Russian No 3, May-Jun 81
(manuscript received 26 Sep 80) pp 319-324

KARPOVA, Ye. F., GUSHCHIN, B. V., TSILINSKIY, Ya. Ya., GUSHCHINA, Ye. A. and KLIMENKO, S. M., Institute of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] A description is provided of zonal centrifugation in glycerin gradient and gel filtration techniques employed to isolate multiploid VEE viruses from a clone in which they accounted for 20-25% of the total viral particles. The resultant preparations consisted of 70-90% of the multiploid viruses, and retained their characteristic structure, infectivity, and hemagglutination. They differed from the mononucleoid virions in terms of the sedimentation rate and buoyant density (1.15 g/cm³ for the multiploid virions and 1.19 g/cm³ for the mononucleoid particles). Figures 6; references 6: 2 Russian, 4 Western.
[317-12172]

PRODUCTION OF TWO BIOLOGICAL VARIANTS FROM ONE STRAIN OF RABIES VIRUS

Moscow VOPROSY VIRUSOLOGII in Russian No 3, May-Jun 81
(manuscript received 13 Oct 80) pp 315-318

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[Abstract] Studies were conducted on the isolation of two biological variants of the rabies virus obtained from several sources via brain passage in outbred mice. This approach resulted in the isolation of one biological variant promoting acute disease with high brain titers (approaching $7.5 \lg LD_{50}/0.03 \text{ ml}$) and an incubation period of ca. 3 days, and another yielding infections with 10 to 1000-fold lower brain titers with a longer (11 day) incubation period. These findings point to the heterogeneity of rabies virus populations. Figures 3; references 6: 2 Western, 4 Russian.
[317-12172]

MORPHOGENESIS OF HUMAN ROTAVIRUS IN TISSUE CULTURE

Moscow VOPROSY VIRUSOLOGII in Russian No 3, May-Jun 81
(manuscript received 13 Nov 80) pp 309-315

KOROLEV, M. B., KHAUSTOV, V. I. and SHEKOYAN, L. A., Institute of Poliomyelitis
and Viral Encephalitides, USSR Academy of Medical Sciences, Moscow

[Abstract] Ultramicroscopic studies were conducted on the assembly of human rotaviruses in green monkey kidney cell cultures after 5 and 12 serial passages. The initial stages of morphogenesis were associated with cytoplasmic inclusions; later, the peripherally formed core particles were transferred by budding into the cisternae of the endoplasmic reticulum for maturation. Differences between the 5-passage viruses and the 12-passage viruses consisted of predominant production of bilayer capsids in the latter case, which is believed to be related to greater infectivity of the latter viruses. Furthermore, the more adapted viruses (after 12 passages) showed earlier maturation, the presence of two types of inclusions in the cytoplasm, and the absence of undifferentiated subviral particles in the cisternae. Figures 11; references 15: 2 Russian, 13 Western.
[317-12174]

COMMON HEMAGGLUTININ OLIGOPEPTIDES IN INFLUENZA A VIRUSES

Moscow VOPROSY VIRUSOLOGII in Russian No 3, May-Jun 81
(manuscript received 13 Nov 80) pp 271-274

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[Abstract] In view of the fact that light chain oligopeptides of influenza A hemagglutinin are relatively stable in terms of antigenic drift, such preparations were subjected to electrophoretic and chromatographic mapping in order to delineate taxonomic and evolutionary relationships among 17 strains of human and animal influenza A viruses. The resultant data showed the presence of common peptides among human and animal isolates, leading to the conclusion that there is a single, but extremely heterogenous, population of influenza viruses actively exchanging genes on an on-going basis. The lack of herd immunity among animals favors the persistence of the more 'ancient' serologic strains, which may cause epidemics or pandemics once human herd immunity has sufficiently abated after a period of time. Figures 4; references 9: 4 Russian, 5 Western.
[317-12172]

UDC 579.842.1/.2:579.252.55] :579.61:616.98:579.842.1/.2]-036.2

SIMPLIFIED TECHNIQUE FOR DETERMINING INCOMPATIBILITY GROUPS OF ENTEROBACTERIACEAE R FACTORS SUITABLE FOR EPIDEMIOLOGIC STUDIES

Moscow ANTIBIOTIKI in Russian Vol 26, No 7, Jul 81
(manuscript received 30 Jan 81) pp 509-513

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[Abstract] A simplified technique has been devised to delineate incompatibility groups of enterobacterial R factors which is suitable for epidemiologic investigations on antibiotic resistance. In this approach bacteria with standard R factors are conjugated with bacteria carrying the unidentified factor--which differ in antibiotic resistance--on marked sections of agar in a Petri dish, with subsequent isolation of transconjugates that have received one of the standard R factors in addition to the innate unidentified R factor. The transconjugates are grown and tested for retention of the 'unknown' R factor by replicate plating onto Petri dishes containing the appropriate antibiotics to determine whether the unidentified R factor belonged to the same incompatibility group as the standard R factor. Figures 2; references 10: 1 Russian, 9 Western.
[316-12172]

COMPARISON OF TRANSFORMING DNAs OF *B. SUBTILIS* AND *B. NATTO* BASED ON SENSITIVITY TO EcoR-1 RESTRICTASE

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 15, No 3, May-Jun 81
(manuscript received 11 Dec 79) pp 64-67

TIKHONOVA, T. N. and MALYUTA, S. S., Institute of Molecular Biology,
Ukrainian SSR Academy of Sciences, Kiev

[Abstract] In order to provide a system yielding restrictase insensitive individual genes or blocks of genes, studies were conducted on the transforming efficiency of certain markers derived from *B. subtilis* and *B. natto* following treatment with the EcoR-1 restrictase. Evaluation of the transformation of auxotrophic and prototrophic *B. subtilis* strains showed that transforming efficiency of adenine, thymine, and riboflavin markers derived from *B. natto* was five to ten-fold greater than the results obtained with *B. subtilis* DNA, indicating that in this case the former source is superior as a gene donor for genetic engineering purposes. Figures 1; references 8: 4 Russian, 4 Western.
[319-12172]

RESULTS AND PERSPECTIVES OF USING TISSUE CULTURE IN TOXICOLOGIC INVESTIGATIONS OF MEDICAL POLYMERS

Moscow GIGIYENA I SANITARIYA in Russian No 6, Jun 81
(manuscript received 20 Feb 80) pp 54-56

LAPPO, V. G., candidate of medical sciences, TIMOKHINA, V. I., candidate of biological sciences, YATSENKO, V. P., candidate of medical sciences, PKHAKADZE, G. A., candidate of biological sciences, GALATENKO, N. A., LIPATOVA, T. E., doctor of chemical sciences, SHUKLINOV, V. P. and SHUMILINA, V. V., All-Union Scientific Research and Testing Institute of Medical Technology, USSR Ministry of Health, Moscow; Institute of Organic Chemistry, Ukrainian SSR Academy of Sciences, Kiev; Kiev Medical Institute; and Institute of Oncologic Problems imeni R. Ye. Kavetskiy, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] Methods are described for comparative evaluation for toxicity of 3 oxygenator membranes when used as liners for explants under subcutaneous tissue derived from outbred albino rats or for a synchronized culture of L line fibroblasts derived from transformed connective tissue, or when extracts of these polymers were injected into the rats for 1.5 months. The results showed that

'Vlatsefan' [sic] membrane, consisting essentially of cellulose acetate, and a PM-1/42 membrane, a polyvinyl chloride polymer, induced degenerative change in tissue culture as well as pathologic sequelae in the rat. However, a Sigma membrane based on siloxane rubber and 'kapron' failed to induce detectable pathology in vivo, while it did promote cytopathology in vitro. The data indicate that while tissue culture methods may serve as indicators of toxicity, considerable further work will have to be conducted to establish definitive correlations between in vitro and in vivo results. References 3: 1 Western, 2 Russian. [306-12172]

ENVIRONMENT

UDC 599.323.4:591.543.43(470.62)

USING HISTOLOGIC DYES AND TETRACYCLINE TO STUDY NORWAY RAT MOBILITY IN KRASNODAR KRAY RICE FIELDS

Moscow ZOOLOGICHESKIY ZHURNAL in Russian Vol 60, No 6, Jun 81
(manuscript received 17 Sep 80) pp 919-926

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[Abstract] Mobility of the Norway rat in the rice fields of the Slavyanskiy Rayon, Krasnodar Kray, was investigated by supplying the rats with feed containing tetracycline and subsequent examination of the skeleton of captured rats for fluorescence under UV light, as well as by supplying them with feed containing fine cotton fibers stained with histologic dyes and subsequent examination of the excreta for the stained fibers. In the latter technique, eosin was the dye of choice. The former approach established seasonal nesting conservatism, while the latter revealed migration patterns and territorial subdivisions among familial groups in the summer. In winter and summer, territorial integrity is maintained, while during spring rice planting territorial migrations appear to be induced by human activity. Figures 4; references 9: 3 Russian, 6 Western.

[311-02172]

NEW DATA ON GAMASID MITES (PARASITIFORMES, GAMASOIDEA) OF SMALL MAMMALS IN IRAN

Moscow ZOOLOGICHESKIY ZHURNAL in Russian Vol 60, No 6, Jun 81
(manuscript received 3 Jun 80) pp 848-855

ZEMSKAYA, A. A., NERONOV, V. M. and FARANG-AZAD, A., Institute of
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[Abstract] As part of a WHO survey, more than 40 species of gamasid mites were collected from small mammals in 1969 and 1970 at 46 locations in Iran. The gamasid fauna was found to be quite heterogenous, consisting primarily of Iranian-Turanian, Central Asian, Mediterranean, and Sahara-Arabian-Sindian species. Palearctic species occupy most of the Iranian territory with the exception of the central area, while West Palearctic species are limited to the angiospermous forests in the northern regions. The zoogeographic diversity of the gamasid mites is predicated upon their association with a variety of hosts, and is much greater than that exhibited by the trombiculid mites and ixodid ticks. Figures 1; references 16: 4 Western, 12 Russian.

[311-12172]

MEDICAL DEMOGRAPHY

UDC 614.7:628.5(47+57)

HYGIENIC PRINCIPLES UNDERLYING REGIONAL DISTRIBUTION AND DEVELOPMENT OF
PRODUCTIVE FORCES IN THE USSR

Moscow GIGIYENA I SANITARIYA in Russian No 6, Jun 81
(manuscript received 19 Mar 80) pp 12-15

CHEREPOV, Ye. M., KORENEVSKAYA, Ye. I., PLETNIKOVA, I. P., MARTYNOVA, N. R.,
DINERMAN, A. A. and IVANOVA, G. V., Institute of General and Communal Hygiene
imeni A. N. Sysin, USSR Academy of Medical Sciences, Moscow

[Abstract] General criteria are presented for planning of distribution and development of productive forces on a regional basis throughout the USSR in accordance with established hygienic norms. Although many theoretical and practical problems remain, planning must take into account natural self-purification potential of the territory in question in light of anticipated permissible emissions from a plant in order that various pollutants not exceed maximum permissible levels. Figures 1.

[306-12172]

MEDICINE

UDC: 616-082.4(47-25)

MOSCOW HOSPITALIZATION STATISTICS

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 4, Apr 81 (manuscript received 27 Apr 80) pp 12-14

[Article by P. M. Isakhanov, V. G. Zaytsev, N. M. Dmitriyeva and B. I. Nikulin, Scientific Research Institute of Emergency Medicine imeni N. V. Sklifosovskiy: "Level of Hospitalization and Routes of Admission of Patients in Moscow Hospitals"]

[Text] One of the cardinal problems in studies of the state of hospital care provided for the public is to determine the bed requirements. This question cannot be answered without determination of the level of hospitalization in a city's hospitals. It is known that this indicator is subject to some fluctuations and is determined by the heterogeneity of the population, degree of development of the outpatient polyclinic network, difference in size and structure of the hospital base, as well as certain other factors.

An in-depth analysis of the actual level of hospitalization of emergency and scheduled patients and routes of admission to hospitals in Moscow as related to nature of disease and time of year had not been made until now. These indicators were studied within the framework of a complex program to determine the hospital bed needs for the capital's population and develop measures to upgrade operational monitoring of optimum use thereof.

In this report we submit an analysis of data referable to actual hospitalization of patients in the seven main categories of diseases.

This study was conducted by the method of complete processing of daily data on patient hospitalization in Moscow for 1977.

As shown by the results of our studies (Table 1), the highest actual level of hospitalization was observed for cases of general medical pathology ["therapeutic"] and "pure" surgical diseases. The level of actual hospitalization was significantly lower for neurological, cardiological, suppurative-surgical and traumatological diseases, and it was in the range of 6.00-6.77/1000 population. This indicator was lowest for urological patients (see Table 1).

The results of this study revealed that the overall level of hospitalization in Moscow referable to all seven categories of diseases studied presented distinct seasonal fluctuations. This indicator had a maximum value in the winter months and minimum value in the summer. The obtained data differ significantly from those reported previously, according to which maximum hospitalization is referable to

the summertime. This difference can be attributed to two factors: migration of residents of Moscow in the summertime and flaws in organizing treatment of dispensary cases at this time of the year.

Table 1. Level of actual hospitalization of patients in 1977 (per 1000 population)

Category of diseases	Actual hospitalization level		
	total	emergency cases	scheduled cases
General medicine (without cardiology)	19.88	15.27	4.61
"Pure" surgery	16.42	12.75	3.67
Neurology	6.77	4.17	2.60
Trauma	6.54	5.50	1.14
Suppurative surgery	6.00	4.59	1.47
Cardiology	6.03	4.94	1.09
Urology	4.45	3.20	1.25

As a result of analysis of overall hospitalization in Moscow, we determined the background against which emergency and scheduled hospitalizations occur.

A comparison of levels of overall, emergency and scheduled hospitalizations revealed that emergency hospitalization constituted the highest percentage (from 61.6 to 84.5%), while scheduled hospitalization occurred in about 24% of the cases. We were impressed by the high indicators for scheduled admission of urological and neurological patients for hospital treatment.

The proportion of emergency and scheduled hospitalizations referable to each category of diseases remained constant in the course of the year. It constituted 4.82 among individuals with traumatic injuries; for cardiological patients, the level of emergency hospitalization was 4.53 times higher than planned hospitalization; for cases of "pure" surgical diseases it was 3.47 times higher, and for those with general medical and "suppurative" surgical diseases it was 3 times higher. This indicator was somewhat lower among urological patients, due to the high level of scheduled hospitalization of such cases.

Seasonal fluctuations of overall hospitalization are largely determined by changes in hospitalization of emergency patients. The level of scheduled hospitalization is more stable; however, there is some parallel between seasonal fluctuations of hospitalization of emergency and scheduled cases. With increase in number of emergency cases there is an increase in scheduled hospitalization, or else it remains at its former level, which is attributable to the need to provide a periodic process and conduct scientific research in clinical hospitals, as well as because of rendering medical care in the narrow specialties to residents of Moscow and nonresident patients. The above resulted in the fact that there were often more patients admitted in the fall and winter than the number of available beds. This created additional difficulties for the staffs of departments and the hospitalization section as a whole.

The decline of emergency hospitalizations in the summer was associated with a decrease in flow of scheduled patients and appearance of empty beds in general medical, "pure" surgical, neurological and cardiological departments. Moreover, many

years of experience of medical institutions revealed that departments are redecorated in most hospitals chiefly in the wintertime, i.e., at the time of the maximum load, which increases even more the seasonal irregularity of bed use.

Table 2. Routes of patient hospitalization [referral sources]

Category of diseases	Hospitalizations, %						
	emergency				scheduled		
	emergency service	poly-clinic	un-organized	total	poly-clinic	management orders	total
"Pure" surgery	47.8	26.75	3.45	77.68	16.45	4.87	21.32
Trauma and its sequelae	52.53	26.47	5.22	84.22	12.44	3.34	15.78
Suppurative surgery	19.28	56.52	3.47	79.22	17.39	3.39	20.78
Urology	34.31	20.99	1.96	57.26	35.90	6.84	42.74
General medicine (without cardiology)	44.39	31.65	1.40	77.44	19.19	3.37	22.56
Neurology	46.72	14.17	0.73	61.62	31.88	6.50	38.38
Cardiology	72.28	8.58	1.08	81.64	13.39	4.97	18.36

The level of hospitalization for trauma of diverse localization is almost one-half in Moscow **that** in other major cities of our country. For patients with acute surgical diseases this indicator was virtually the same in Moscow and major cities of our country. These data can be attributed to several factors that are specific to Moscow (age and occupational composition of inhabitants, easily available emergency care, highly effective measures referable to safety practices and prevention of traffic accidents, etc.).

At the present time, emergency patients in Moscow are hospitalized primarily by the paramedic teams of emergency stations (Table 2). The teams of emergency stations are directly involved in hospitalization of mainly neurological (72.2%), purely surgical (47.8%) and cardiological (72.2%) patients, as well as trauma cases (52.3%). Polyclinic physicians refer for emergency hospitalization mainly patients with suppurative [acute] surgical diseases (56.52%), general medical (31.56%) and urological (20.99%) pathology.

The largest share of emergency hospitalizations was referable to cardiological (81.64%), acute (79.22%) and "pure" (77.68%) surgical patients, as well as individuals with acute trauma and sequelae thereof (84.32%).

For some categories of diseases, there was a high level of admission of scheduled patients. Thus, in the urological and neurological departments, scheduled hospitalizations constituted 42.74 and 38.38% of the cases, respectively. We were impressed by the high percentage of scheduled patients hospitalized by order of hospital management. This route of hospitalization was referable to 4.87-6.84% of the patients admitted for treatment in the "pure" surgical, urological and neurological departments.

With regard to scheduled hospitalization, the emergency station bed requirements are not always taken into consideration for the treatment of emergency patients and casualties, which causes some difficulties in the work of the hospitalization section, which consists of uniform scheduling of admissions in all of the city's

hospitals. These difficulties also arise as a result of irregular discharge of patients on different days of the week. The fewest discharges occur on Saturdays, Sundays and Mondays, while maximum admissions occur on Mondays and Tuesdays. In most hospitals, it becomes necessary to deploy additional beds on the first two days of the week.

Analysis of bed use revealed that departments are closed for repair [redecorating] without consideration of seasonal fluctuations in levels of emergency and scheduled hospitalizations, and the dates for such work are not coordinated with the emergency care station. According to the data for 1977, redecorating work began in most cases in the fall and winter, when there was a significant rise in hospitalization of emergency and scheduled patients.

In view of the fact that emergency care is rendered chiefly at the prehospital phase by emergency station paramedics, it is imperative to solve many problems immediately. First of all, it should be noted that the insufficiently efficient bed use and irregular admission of emergency cases in different hospitals of the city can be attributed largely to the lack of a hospitalization center. At the present time, although there is some bed shortage in Moscow, establishment of a hospitalization center would permit more effective regulation of admission of scheduled patients in accordance with the level of emergency hospitalizations at different times of year.

On the basis of the obtained data, several suggestions can be made to improve the system of hospitalizing emergency and scheduled patients.

It would be expedient to have a single hospitalization center in major cities, which should issue operational information about the number and structure of emergency and scheduled patients, as well as availability of beds in hospitals for scheduled hospitalizations. The main task of such a center should be considered optimum hospitalization of emergency cases. The efficiency of the work of the hospitalization center is directly related to the availability of facilities for automated processing of incoming data and delivery of the necessary information to the pertinent departments of the center.

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CSO: 1840/267

UDC 578.832.1:578.72

IMPROVED METHOD FOR TESTING INFLUENZA VIRUS INFECTIVITY

Moscow VOPROSY VIRUSOLOGII in Russian No 3, May-Jun 81
(manuscript received 24 Jul 80) pp 298-304

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[Abstract] An effective means of determining influenza virus infectivity consists of the agar overlay technique, in which cytopathic plaques are formed under an agar layer poured over the cultured cells after addition of the virus. More rapid results and more clearly delineated plaques are obtained by incorporating trypsin or other proteolytic enzymes into the agar which split the hemagglutinin of newly formed virus and thus enhance their infectivity. However, the enzymes also act on the hemagglutinin of noninfectious virus which adheres to cells and often gives spuriously high infectivity values. This problem was corrected in studies with chick fibroblast cultures by overlaying them with plain agar immediately after exposure to the viral preparation, and adding an additional layer of trypsin-containing agar 16-18 h later. During the intervening period of time the adsorbed noninfectious viruses became inactivated and did not affect the infectivity titers. Figures 3; references 12: 1 Russian, 11 Western.
[317-12172]

UDC 616.9:578.832.1]-092.9

MURINE MODELS OF LATENT INFLUENZA INFECTION

Moscow VOPROSY VIRUSOLOGII in Russian No 3, May-Jun 81
(manuscript received 9 Jun 80) pp 280-285

ZUYEV, V. A., PAVLENKO, R. G., MIRCHINK, Ye. P., KHARITONOVA, A. M.,
BELYAYEV, D. L. and DENISOV, L. A., Institute of Epidemiology and Microbiology
imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] Animal model studies were conducted on mice to elucidate certain parameters of latent influenza infections, using influenza virus A (HON1),

strain WSN, and SHK mice. Studies on tissue persistence of the virus following a clinical infection, immunization with a live vaccine, or vertical transmission by females to progeny demonstrated that low levels of virus ($1 \lg \text{EID}_{50}/0.2 \text{ ml}$) persisted after clinical infection (for 112 days) or active immunization (35 days). However, vertical transmission resulted in high levels of the virus in the blood and organs of recipients (10^1 to $10^2 \text{ EID}_{50}/0.1 \text{ ml}$) in the presence of anti-hemagglutinins, which suggested a future course of severe influenza pathology. These findings showed that latent influenza infections may be induced in mice by at least three different pathways. Figures 2; references 13: 3 Western, 10 Russian.
[317-12172]

UDC 615.332.017:615.277.3

NEW ANTINEOPLASTIC ANTIBIOTICS 5590 AND 2928

Moscow ANTIBIOTIKI in Russian No 7, Jul 81 (manuscript received 11 Feb 81)
pp 483-487

SELEZNEVA, T. I., BRAZHNIKOVA, M. G., KONSTANTINOVA, N. V., TOLSTYKH, I. V., FEDOROVA G. B., BORISOVA, V. N., RUBASHEVA, L. M., KATRUKHA, G. S. and BAZHANOV, V. S., All-Union Scientific Research Institute for the Search for New Antibiotics, USSR Academy of Medical Sciences, Moscow

[Abstract] Two actinomyces cultures from soil samples, designated as 5590 and 2928, were found to yield crystallizable antibiotics possessing antineoplastic properties with respect to murine lymphosarcoma and lymphadenosis. Spectral and chemical analysis revealed 5590 and 2928 to be similar peptides possessing a lipophilic chromophore group responsible for UV absorption peaks at 240-245, 297, 307-308, and 353-355 nm. Amino acids found in 5590 and 2928 were glycine, serine, threonine, 4-hydroxyproline and, in the case of 5590, an unidentified basic amino acid. Additional amino acids found in 2928 were valine, leucine, and isoleucine. Both antibiotics evidenced high antineoplastic activity but narrow therapeutic ranges. Figures 4; references 2 (Russian).
[316-12172]

QUANTITATIVE AND QUALITATIVE CHANGES IN SERUM PROTEINS IN SIGMODON HISPIDUS
INVADED BY LARVAL CYSTS OF ALVEOCOCCUS MULTIOCLARIS

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian, Vol 50,
No 2, Mar-Apr 81 (manuscript received 6 Jun 80) pp 39-42

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RSFSR Ministry of Health; Institute of Medical Parasitology and Tropical
Medicine imeni Ye. I. Martsinovskiy, USSR Ministry of Health, Moscow

[Abstract] Experimental alveococcosis was induced in 50 cotton rats (*Sigmodon hispidus*) and early changes in serum proteins were studied. Marked dysproteinemia was seen in subjects as the parasite developed: a drop in the albumin-globulin and albumin-alpha2-globulin ratios, the appearance of C-reactive protein, and reduced urea. Disc electrophoresis revealed the presence of fast and slow post-transferrins and post- and pre-albumins 15 to 45 days after infection. It is suggested that the serum protein changes in alveococcosis result from the presence of parasitic products, development of the immune response and irritation of the reticuloendothelial system. The early appearance of these changes can be of value in clarifying the pathogenesis and diagnosis of alveococcosis. References 26: 18 Russian, 8 Western.
[292-9642]

SPECIFICITY IN PARASITE-HOST RELATIONSHIPS IN TRYPANOSOMIASIS IN RATS

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian
Vol 50, No 2, Mar-Apr 81 (manuscript received 22 Apr 80) pp 67-70

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[Abstract] The nature of the specificity involved in the interaction of the parasite (*Trypanosoma lewisi*) and the host (*Rattus norvegicus*) was studied. The findings showed that a typical invasive process occurs only when the host is infected parenterally and that *T. lewisi* is not immunogenic for the host. No other species of experimental animal was infected by rat trypanosomiasis; *T. lewisi* was highly antigenic for them. Antigen prepared from *T. lewisi* in rabbits had marked immunogenic and antigenic properties but a large dose of it administered to *Rattus norvegicus* did not stimulate the production of agglutinins or complement fixing antibodies. This indicates that this rat does not possess antigenicity with respect to *T. lewisi*. The similarity of the parasite and host in regard to antigens, found experimentally, confirms the suggestion that one of the reasons for the prolonged vitality of *Trypanosoma* in *Rattus norvegicus*

is precisely this similarity. It is suggested that phylogenic factors are involved in the adaptation of both hosts and parasites that are now compatible. References 31: 13 Russian, 18 Western.
[292-9642]

UDC 616.993.161-022.39: 591.69-932.34: 576.893.161.13

LEVEL OF INFECTIVITY IN THE GERBIL RHOMBOMYS OPIMUS, LICHT. BY LEISHMANIA MAJOR
IN YEARS WHEN NUMERICAL STRENGTH IS REDUCED

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian
Vol 50, No 2, Mar-Apr 81 (manuscript received 20 May 80) pp 71-76

SOLOV'YEVA, T. V., KONSTANTINOVA, M. Yu. and SHENBROT, G. I., Institute of Medical Parasitology and Tropical Medicine imeni Ye. I. Martynovskiy, USSR Ministry of Health; All-Union Scientific Research Institute of Nature Preservation and National Parks, USSR Ministry of Agriculture, Moscow

[Abstract] Material collected during field studies conducted over a 4-year period (1975-1978) in South Uzbekistan, north of the Karshi oasis in the Karshi steppe, on infection of the gerbil *Rhombomys opimus* with *Leishmania major*, and other species possibly infected with zoonotic dermal leishmaniasis, was analyzed in an attempt to clarify the reasons for the persistently high occurrence of this disease in *Rhombomys opimus* even when the numerical strength of the species is depleted. The numerical strength of *Rhombomys opimus* was depressed during this period, with only 13.4 percent of burrows in use in 1976-1977 compared with a normal level of 88-95 percent. Based on a sample of 1,031 animals it was found that the rate of infection with zoonotic dermal leishmaniasis was 50 percent higher than when the gerbil population was not depressed; this represents an absolute level of 70-100 percent. In all other species investigated (hedgehogs, jerboa and other species of gerbil) only 0.70 percent were found to be infected. The retention of *Leishmania major* in *Rhombomys opimus* appears to be insured, on the one hand, by the chronic course of the infection in this species, and on the other, by the numbers of *Phlebotomus* present in the areas studied. The findings indicate that *Rhombomys opimus* should be completely destroyed in areas of natural infection with *Leishmania major*, since substantial reductions in their numbers is ineffective in preventing the spread of this parasite. References 24 (Russian).
[292-9642]

NEW DATA ON TRICHOSTRONGYLIDAE PARASITIZING MAN

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian
Vol 50, No 2, Mar-Apr 81 (manuscript received 11 Mar 80) pp 17-18

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Medicine imeni S. M. Kirov; Institute of Zoology, Azerbaijan SSR Academy of
Sciences, Baku

[Abstract] The high incidence of Trichostrongylidae infection in man in the mountainous regions of the Azerbaijan SSR prompted an investigation of the species involved. Some 64 samples of fecal matter taken over a period of 5 days from 64 patients following treatment for trichostrongylosis were tested in order to identify the species involved. Of the samples, 49 contained 1 species, 13 contained 2, two contained three, and another two contained four species. The species found were: *Trichostrongylus axei*, *T. capricola*, *T. colubriformis*, *T. skrjabini*, *T. vitrinus*, *Ostertagia circumcincta*, *O. ostertagi*, and *Nematodirus spathiger*. This is the first time that *Nematodirus spathiger* has been found in man (two cases) and the first time that *T. capricola* has been recorded in man in the Azerbaijan SSR (6 cases). The morphologic features of these two latter species are shown. References 10: 8 Russian, 2 Western.
[292-9642]

UDC 616-022.39:598.2-154.343(049.32)

BIRD MIGRATION AND TRANSFER OF INFECTION VECTORS (ECOLOGICAL AND GEOGRAPHICAL LINKS BETWEEN BIRDS AND VECTORS OF INFECTION)

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 1,
Jan-Feb 81 pp 85-87

ALEKSEYEV, A. N.

[Abstract] The author reviews a book with the above title written by D. K. L'vov and V. D. Il'ichev published in 1979 by the "Nauka" publishing house. The book deals with the question of the role of birds in the temporal and spatial circulation of the vectors of various diseases, within the USSR, mainly those affecting man. The authors have set themselves the task of covering all the main aspects of the connections between disease vectors and birds and of tracing the various routes by which the vectors reach man. Information on all the arboviruses and their tick hosts is presented, and the latest findings on more recently discovered viruses are also examined in the context of their relationship with birds. The book is a useful reference for a wide range of biologists and physicians interested in the problems of disease and natural sites of infection.
[291-9642]

UDC 616.988.25-022.395.42-084.484: 614.778: 615.285.7

DDT RESIDUES IN GRASS AFTER ANTI-TICK TREATMENT AT SITES OF NATURAL INFECTION FOR
TICK-BORNE ENCEPHALITIS CARRIED BY IXODES PERSULCATUS

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 1,
Jan-Feb 81 (manuscript received 25 Oct 79) pp 66-71

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[Abstract] Plant material collected during the period 1970-1974 in the north of
Kemerovskaya Oblast was tested for DDT residues following treatment with a 10-
percent DDT dust during the period 1956-1973 to deal with *Ixodes persulcatus*.
All dusting was done from aircraft during the very early spring before the snow
cover had melted. The dose was 5 kilograms per hectare. DDT residues were
found in all plants studied, regardless of the condition of the tree stand, the
local terrain or the period elapsed since treatment. The content of residue was
affected by the state of the tree stand. Amounts found varied from below
0.4 mg/kg to above 3.2 mg/kg; the amounts decreased with time. The concentrations
found were considerably less than when DDT is used in agriculture, and they pre-
sent no threat to man or animals. Nevertheless, it is recommended that when DDT
is used to deal with natural sites of infestation with the tick-borne encephalitis
virus grazing land and land carrying grain should be avoided; if this is not
possible, the land should not be used for these purposes for 3 to 4 years after
DDT treatment. Figures 2; references 31: 20 Russian, 11 Western.
[291-9642]

UDC 576.858.25.095.38: 576.895.42

IXODES AND VECTOR OF TICK-BORNE ENCEPHALITIS REPORT 3: SUMMARY OF FINDINGS
AND CONCLUSIONS

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 1,
Jan-Feb 81 (manuscript received 16 Apr 79) pp 58-61

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Parasitology and Tropical Medicine imeni Ye. I. Martsinovskiy, USSR Ministry
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of Medical Sciences, Moscow

[Abstract] Findings from studies of the ecology of the tick-borne encephalitis
virus are summed up. The following issues are discussed: the degree to which
the tick-borne encephalitis virus affects the tick host; tick receptivity to
the tick-borne encephalitis virus; the ability of the virus to transovarial and
transphase transmission; the ability of the tick to transfer the virus during

the action of blood sucking. *Dermacentor reticulatus* (D. pictus) is most susceptible to viral infection. *Ixodes persulcatus* shows greatest receptivity to the virus. All ticks studied are capable of transmitting the virus by transovarial and transphase means. Most researchers accept that the virus is transmitted during blood sucking. In natural conditions, *Ix. persulcatus* and *Ix. ricinus* are the most favorable vehicles for the retention of the virus. References 23: 20 Russian, 1 Polish, 2 Western.
[291-9642]

UDC 576.89⁵.42.095.38: 576.858.25

EXPERIMENTAL CHARACTERIZATION OF TAIGA TICK (*IXODES PERSULCATUS*, SCHULZE 1930)
AS VECTOR FOR TICK-BORNE ENCEPHALITIS VIRUS

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARZITARNYYE BOLEZNI in Russian No 1,
Jan-Feb 81 (manuscript received 30 Jun 80) pp 53-57

KURENKOV, V. B., CHUNIKIN, S. P., KOCHETOVA, G. A., RESHETNIKOV, I. A. and
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USSR Academy of Medical Sciences, Moscow

[Abstract] An experimental study was made of infectivity for tick-borne encephalitis in *Ixodes persulcatus* and of quantitative patterns in the transphase and transmission transfer of this virus as a function of infectivity. Laboratory experiments were conducted on six strains of tick-borne encephalitis virus obtained from the USSR, Yugoslavia and Czechoslovakia: BK-5, B-493, NK-2, Brach-12, Tring and Skalitsa. Infectivity for *Ix. persulcatus* was as follows: 2.0 lg iD₅₀ (threshold for preimago stages); 2.7-4.2 lg LD₅₀ (10-20 percent for nymphs and larvae); 3.8-5.2 lg LD₅₀ (30-50 percent for larvae) and 3.8-4.5 lg LD₅₀ (for nymphs); 5.5-6.4 lg LD₅₀ (80 percent for larvae) and 5.0-6.0 lg LD₅₀ (80 percent for nymphs); 6.4-7.8 lg LD₅₀ (100 percent for larvae). All individuals appeared to transfer the virus in the subsequent phase. No differences were found in transphase transfer as a function of the object (larvae or nymphs) of infection. Transmissive transfer of the virus occurred during feeding in almost all cases. The question of variable immunity in host animals remained unclear. References 11: 3 Russian, 8 Western.
[291-9642]

ACTIVATION OF ADULT IXODES PERSULCATUS TICKS WITH DIFFERENT PATTERNS OF DEVELOPMENT IN NYMPH PHASE

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 1, Jan-Feb 81 (manuscript received 10 Sep 79) pp 49-53

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[Abstract] An attempt was made to clarify the seasonal course of imago activation in *Ixodes persulcatus* in different development conditions in the preceding stage. Laboratory experiments were conducted using ^{14}C -labeled ticks under conditions approximating the natural as closely as possible. The work was done on 400 labeled imagos (800 collected from a total of 3,000 labeled nymphs) at the Sayan Epidemiological Station in the foothills of West Sayan during the period 1969-1976. The results showed that the presence of the radioisotope appeared to exert no or only an insignificant effect on the emergence of the ticks, thus indicating that the method can be used in field studies. A comparison of ticks in which diapause occurred or did not occur showed that this factor did not affect activation of the imago in the spring, but in those ticks in which it had occurred, the period of activation was shorter. The findings indicated that the imago population of *Ix. persulcatus* in the experimental zone does not remain constant: at least two generations are involved during the spring period, those developing with diapause and those developing without it. By the end of the season only individuals in which diapause did not occur remained. Further studies to determine the duration of activity in this tick are required to resolve this question definitely. Figures 3; references 17: 16 Russian, 1 Western.
[291-9642]

UDC 576.895.772.01: 625.1(571.5)

HORSEFLIES IN Khabarovskiy Kray in BAM Railroad Construction Zone

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 1, Jan-Feb 81 (manuscript received 7 Jan 80) pp 27-32

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[Abstract] During the period 1977-1979 a survey was made of horseflies found in Khabarovskiy Kray. Of the 36 species recorded for the area (*Chrysops* (8), *Tabanus* (5), *Atylotus* (1), *Hybomitra* (19), *Haematopota* (3)), 27 were found during the survey. The specific makeup in Khabarovskiy Kray is very similar

to that in Amurskaya Oblast, with 32 of the 39 species coinciding, and in Primorskiy Kray, with 34 of 48 species coinciding. The horseflies found in Khabarovskiy Kray can be divided into three subregional types belonging to the Palearctic area fauna represented by six fauna types (tundra, taiga, European-Siberian forest, East (South) Siberian, East Asiatic, Afroeurasian arid). The most numerous are species belonging to the taiga type, and the least numerous those classified as East Siberian. References 13 (Russian).
[291-9642]

UDC 576.895.771.095.38: 576.893.192.6].01(47 + 57)

SPREAD OF POPULATIONS OF DDT-RESISTANT MALARIA VECTORS IN USSR

Moscow MEDITSINSKAYA PARAZITOLOGIYA I PARAZITARNYYE BOLEZNI in Russian No 1, Jan-Feb 81 (manuscript received 24 Sep 80) pp 3-9

ALEKSEYEV, A. N., DROBOZINA, V. P. and BONDAREVA, N. I., Institute of Medical Parasitology and Tropical Medicine imeni Ye. I. Martsinovskiy, USSR Ministry of Health, Moscow

[Abstract] A survey was conducted to evaluate the presence of DDT-resistant *Anopheles* species in the USSR. Determination of resistance was made in accordance with WHO standards. The territory covered by the survey included all the southern republics of the country; the survey was also extended to a number of areas in the Moscow, Voronezh, Kursk and other administrative areas in order to clarify the extent of territorial spread. The northern border delimiting the extent of the spread can be drawn at the 50th parallel. South of this line virtually all *Anopheles* species can be considered DDT-resistant. Areas of highest resistance included parts of the Azerbaijan SSR, Donetskaya Oblast in the Ukraine, and Klubyaskaya Oblast in the Tajik SSR, with percentages running as high as 70 percent. The patterns of the spread are determined by the features of the landscape, with the most resistant species being found in isolated valley areas (*A. sacharovi*, *A. messeae*, *A. atroparvus*, *A. hyrcanus*) and mountainous areas (*A. maculipennis*, *A. superpictus*); the evenness (or spottiness) in the level of resistance correlates with the use (or not) of insecticides in a given area. In this respect, the greatest variations are found in the republics of Central Asia. Figures 4; references 14: 14 Russian.
[291-9642]

THERAPEUTIC EFFECTIVENESS OF REMANTADIN AND ANTIGRIPPIN IN PATIENTS WITH INFLUENZA A1 (H1N1) DURING THE 1977-1978 EPIDEMIC

Kiev VRACHEBNOYE DELO in Russian No 6, Jan 81 (manuscript received 27 Aug 80)
pp 109-111

ZLYDNIKOV, D. M., ROMANOV, Yu. A., RUMEL', N. B., VASILEVSKAYA, N. M.,
GEYKER, V. I., ZAKHAROVA, N. G., PADALCO, Yu. V., KHLOPOVA, I. N., EL'KIN, V. M.
and ZHERBINA, L. A., Leningrad

[Abstract] A group of 950 in- and out-patients with serologically confirmed influenza--A1 (H1N1) outbreak during 1977-1978--and/or clinical evidence of acute upper respiratory infection were treated with either remantadin (2 tablets b.i.d. beginning with the first day, then 1 tablet t.i.d. for 2 days), antigrippin (aspirin + ascorbic acid + calcium lactate + rutin + dimedrol), or a combination of the two. The results showed that maximum benefit to the patient was derived from the remantadin + antigrippin combination. In patients with serologically confirmed influenza, the number of work days lost due to sickness decreased by 1.3 days with early remantadin administration, and the incidence of complications was 3.5-fold lower than in the antigrippin group (25.7% vs. 7.9%). In patients with "clinical" influenza the combination of remantadin and antigrippin yielded an incidence of complications of 11.7%, i.e., 2.5-fold lower than the incidence (28.17%) with antigrippin alone. Furthermore, in the latter case combined treatment lowered the number of days lost from work from 7.1 with antigrippin alone to 6.1 days with the combination.
[312-12172]

MEDICAL AND GENETIC SIGNIFICANCE OF STUDIES ON PROVISORY HUMAN ORGANS

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 15, No 3, May-Jun 81
(manuscript received 20 Mar 80) pp 83-88

BRUSILOVSKIY, A. I. and KRIVOSHEINA, G. N., Crimean Medical Institute,
Simferopol'

[Abstract] A review of Soviet and non-Soviet literature on prenatal diagnosis is provided, dwelling largely on the information to be obtained from amniocentesis and histologic and chemical evaluation of the placenta. Among the topics covered are the determination of sex of the fetus, chromosomal abnormalities, genetically determined metabolic disorders, and polymorphism of placental alkaline phosphatase. References 47: 13 Russian, 34 Western.
[319-12172]

PHYSIOLOGY

UDC 613.68:359.2+615.276.4.015.4.612.766.1.014.49-057:359.2

EFFECT OF ELEUTHEROCOCCUS ON BODILY FUNCTIONING AND PERFORMANCE CAPACITY OF SAILORS AT SEA

Moscow VOYENNO-MEDITSINSKIY ZHURNAL in Russian No 2, Feb 81 pp 48-51

[Article by Lieutenant Colonel of the Medical Service V. V. Berdyshev]

[Text] Experimental studies have indicated that eleutherococcus extract promotes an increase in human mental and physical performance capacity, normalization of functions, improves the thermal resistance of the body, and accelerates its adaptation to complicated and unusual environmental conditions (Ye. F. Baburin, 1966; I. V. Dardymov et al., 1966; S. A. Brandis, V. N. Pilovitskaya, 1966; I. I. Brekhman, 1968, 1976; I. A. Gagarin, 1977, and others). Taking into consideration these properties of eleutherococcus, we used it to accelerate the process of adaptation and maintenance of stable performance capacity of sailors in the tropics.

The conducted studies established that for the majority of sailors (82%), the most effective dose of eleutherococcus when it is administered once during the day is 4 ml. This dose was also prescribed to preserve the normal functioning of the body and to improve the performance capacity of the ship specialists during intensive and important work at different stages of the trip. The dose was changed individually only for a comparatively small number of sailors (about 15%). Most often it was either dropped to 2 ml, or increased to 8 ml. The study results are presented in tables 1 and 2.

After single administration of eleutherococcus in an optimal dose 30 minutes before work (watch) during the day, 48 sailors of different specialties had indicators of complex and simple sensomotor reaction, as well as indicators of arrangement of numbers for the watch which were impaired reliably less as compared to the control group. The decrease in strength of the hand, endurance for static force, increase in hand tremor, and reduction in lability of the visual analyzer were less pronounced.

A more favorable reaction of the cardiovascular system to dosed physical load was noted. Vascular resistance and indicators of phagocytic activity of the blood leukocytes diminished less. The reaction of the adrenal glands to thermal and physical loads was less pronounced. On the whole, the individuals who took eleutherococcus had considerably improved performance capacity indicators, rate and accuracy of fulfilling individual operations and commands, and the number of erroneous actions in the watch diminished reliably (1.8-fold, $P < 0.01$).

Table 1. Effect of Eleutherococcus on Indirect Indicators of Performance Capacity of Sailors after Their Watch

Indicators		At beginning of sailing	At end of sailing
Arrangement of numbers	signs arranged	15 ± 1 17 ± 0.34	$16 \pm 0.34^*$ 16.9 ± 0.33
	number of errors	$3.2 \pm 0.34^{**}$ 2.4 ± 0.18	$3.7 \pm 0.21^*$ 3 ± 0.22
Complex sensomotor reaction	reaction time, ms	447 ± 14 433 ± 11	467 ± 12 440 ± 11
	number of errors	$4.1 \pm 0.35^{**}$ 2.7 ± 0.26	$4 \pm 0.33^*$ 3.1 ± 0.28
Simple sensomotor reaction, ms		$241 \pm 3.6^{**}$ 224 ± 3	242 ± 3.7 233 ± 2.8
Strength of hand, kg		$45.2 \pm 0.7^*$ 47.5 ± 0.6	44.4 ± 1.2 47.2 ± 0.9
Endurance for static force, s		28.3 ± 2.6 32 ± 1.8	25.8 ± 1.9 27.7 ± 1.3
Tremometry, number of contacts		$70 \pm 1.7^{**}$ 63.2 ± 1.2	$73 \pm 1.7^{**}$ 64.9 ± 1
Critical frequency of blending of light flashes, rel. unit		$38.9 \pm 0.5^{**}$ 41.2 ± 0.4	$38.6 \pm 0.5^{**}$ 40.4 ± 0.42

Note. The numerator gives the data of a control study, the denominator is after the administration of eleutherococcus. Statistically significant differences in the groups: * $D < 0.05$; ** $D < 0.01$.

There was a noticeable improvement in the functional condition after administration of 4 ml of eleutherococcus in 36 out of the 48 subjects. In 12 people, the changes were missing or the indicators did not drop sharply. The subjective state, endurance of thermal loads and performance capacity improved in 29 sailors. The state of health did not noticeably change in 15. Four people experienced drowsiness for 30-90 min after taking the preparation.

In order to prevent these conditions in the future, the dose of eleutherococcus was reduced for these people, and at the same time, 20-30 g of sugar or an infusion of Chinese Schizandra of 2-3 ml per dose were prescribed. Sugar apparently promoted a reduction in these individuals in the greatest individual pronouncement of the hypoglycemic effect associated with taking eleutherococcus (I. I. Brekhman, 1968; I. V. Dardymov, 1976). The effect of Chinese Schizandra can be explained by an increase in the functioning of the sympathetic-adrenal system on the background of a certain dominance of parasympathetic tone which develops after taking eleutherococcus.

Dynamic observations of the subjects in 4, 8, 12 and 16 h after taking the preparation showed that eleutherococcus promotes a noticeable acceleration in the restorative processes after work under unfavorable microclimate conditions. Thus,

after taking 4 ml of the extract the majority of examined indicators in the subjects reached a background level in 4 h after the watch. In the control group in this period, the indicators of vascular resistance, phagocytic activity of the blood leukocytes, endurance for static force, **tremometry**, content of eosinophils in the blood and 17-ketosteroids in the urine were worse than the background values.

In the observation before the next watch, and after it, the level of examined indicators of the functions, as well as the general state of health of the sailors in the control and experimental examinations did not have significant differences. A similar law was found after taking of 2 and 8 ml of eleutherococcus. The findings indicate that the pronounced positive effect of a single administration of eleutherococcus on the human body in the tropics is preserved as a minimum for 8-9 h after taking of the preparation.

The effect of a single dose of eleutherococcus on the functional condition of the body noticeably changed depending on the phase of the adaptation process and the intensity of work of the specialists. The preparation was the most effective in the acute phase of adaptation (first days of sailing in the tropics) and at the end of the trip. Its positive effect was pronounced to a lesser degree in the period of development of the phase of relative adaptation during stabilization of

Table 2. Effect of Eleutherococcus on Certain Indicators of Functions in Sailors after Their Watch

Indicators		At beginning of sailing	At end of sailing
Pulse, beats per minute	before load	97.3 ± 1.7 94.8 ± 1.4	$94.8 \pm 0.7^{**}$ 90 ± 1.6
	after load	137 ± 2.5 131 ± 2.3	$132 \pm 2.4^*$ 124 ± 2.7
Systolic pressure, mm Hg	before load	$100 \pm 1.6^{**}$ 107 ± 1.1	99.7 ± 1.5 104 ± 2.1
	after load	$112.7 \pm 2^{**}$ 121 ± 1.7	$112.8 \pm 1.8^*$ 118.6 ± 2.1
Coefficient of endurance of cardiovascular system	before load	$28.7 \pm 1.3^{**}$ 23.8 ± 0.7	$28.2 \pm 1.1^*$ 24.2 ± 1
	after load	$25.5 \pm 1.2^*$ 22 ± 0.67	24.2 ± 1 23.2 ± 0.7
Phagocytic activity of blood leukocytes	percentage of phagocytosis	22.4 ± 2.2 28.7 ± 2.9	27 ± 1.7 31.3 ± 2.3
	phagocytic index	5.4 ± 0.45 6.8 ± 0.6	6.6 ± 0.49 7.9 ± 0.76
Percentage of individuals with drastically reduced vascular resistance		$\frac{36}{31}$	$\frac{27}{22}$
Eosinophils of blood, in smear made of 400 cells		$2.9 \pm 0.32^*$ 4.1 ± 0.35	$5.3 \pm 0.54^*$ 6.8 ± 0.37
17-ketosteroids of urine, mg/h		-	0.72 ± 0.04 0.62 ± 0.05

Notes the same as for table 1.

the level of bodily functions and performance capacity. In particular, in this case after taking 4 ml of eleutherococcus the indicators of phagocytosis, vascular resistance, osmotic resistance of the blood erythrocytes did not improve reliably in the subjects. The effect of adaptogen on the indirect and direct indicators of performance capacity was less noticeable in the subjects in contrast to the observations in the beginning and end of sailing. The greatest effect of using eleutherococcus was noted in the period of intensive work under unfavorable environmental factors and usually was not manifest in not-very-tiring activity in almost comfortable microclimate conditions.

The nighttime was characterized by the lack of a pronounced positive effect after single use of eleutherococcus (in doses from 1 to 4 ml) in the majority of those examined. In only 16 of the 48 were noticeable positive shifts observed in the examined indicators. This circumstance contradicts the results of studies by T. A. Sosnova and M. I. Bykova (1976) who made note after the taking of 2 ml of eleutherococcus of a considerable improvement in the functioning of the visual analyzer and the performance capacity of railroad machinists on the night shift.

The lack of an effect in our observations is apparently explained by the specific features of the reactivity of the individuals who were not adapted to working a night shift. Subsequently, in order to improve the performance capacity of the sailors during the night watch, eleutherococcus was used with a good result in combination with a glucose-vitamin drink (4 ml of eleutherococcus extract, 20 g of sugar and 500 mg of ascorbic acid per 200 ml of water), as well as in combination with Chinese Schizandra (4 ml of extract of eleutherococcus and 2-3 ml of alcoholic infusion of Schizandra).

Conclusions

1. Extract of eleutherococcus used once in a dose of 4 ml 30 min before work promotes normalization of the bodily functions and improves the performance capacity of sailors during day watches in the tropics. It accelerates the course of restorative processes during the post-watch rest. The positive effect of the preparation is traced clearly in 8-9 hours after its use.
2. The most effective use of eleutherococcus is during intensive work under unfavorable environmental conditions, in the acute phase of adaptation, and in the emergence of dysadaptation disorders.
3. The use of a single dose of eleutherococcus in the tropics at night is less effective. The extract has a positive effect together with Chinese Schizandra or glucose-vitamin drink.

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POSSIBLE MECHANISMS IN VARIED EFFECT ON BEHAVIOR OF ACTH₄₋₁₀ AND ITS ANALOG CONTAINING D-ISOMER PHENYLALANINE

Moscow ZHURNAL VYSSHEY NERVNOY DEYATEL'NOSTI IMENI I. P. PAVLOVA in Russian
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[Abstract] A comparative study was made of the effect of two oligopeptides--ACTH₄₋₁₀ and one of its analogs containing D-isomer phenylalanine on the 7th position of the ACTH molecule (met-gly-his-D-phe-lys-phe; D-phe-hexapeptide)--on spontaneous behavior in animals and on the processes associated with situational memory, in an attempt to elucidate possible mechanisms involved in their action. Experiments were conducted on male albino rats that were taught to find food in a T-maze. The experimental substances were administered in doses of 15 micrograms/kilogram body weight and the behavior of the animals in "open-field" situations was observed. It was found that while ACTH₄₋₁₀ enhanced the memory-learning process in the T-maze maze, D-phe-hexapeptide had the opposite effect. The two substances produced the same effect in "open-field" learning, but ACTH₄₋₁₀ was more effective in "incomplete recall" situations. ACTH₄₋₁₀ increased orientation search activity in subjects in stress situations, while D-phe-hexapeptide reinforced the passive defense reaction. It is suggested that ACTH₄₋₁₀ improves tracking processes regardless of reinforcement, while D-phe-hexapeptide possesses a selective action seen in negative reinforcement. Figures 5; references 13: 3 Russian, 10 Western.
[264-9642]

NEW EXPERIMENTAL APPROACHES TO ANALYZING COMPLEX FORMS OF BEHAVIOR

Moscow ZHURNAL VYSSHEY NERVNOY DEYATEL'NOSTI IMENI I. P. PAVLOVA in Russian
Vol 30, No 6, Nov-Dec 80 (manuscript received 31 Oct 79) pp 1181-1186

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[Abstract] A study was made of the process of solution of complex tasks, involving relative and generalized signs (or figures), that require an animal to possess some ability for basic "abstraction" and prediction. Conditioned reflexes were formed in 22 cats such that the animals had a choice in responding to a stimulus indicating the presence of food. Seven series of experiments were then conducted in which the animals had to respond to the stimulus that had now been complicated by the presence of various geometric and nonlinear patterns and variations in illumination in increasing complexity. The increasing complexity of the experiments was designed to lead the subjects from concrete qualitative signs toward analysis of quantitative signs. The results of the new method for analyzing specific and precursor "abstract thought" indicated that cats are able to assess rationally a situation facing them and that the possibility of primitive abstraction is not ruled out. Figures 2; references 17: 12 Russian, 5 Western.
[264-9642]

UDC 612.821.6 + 612.822.3

BEHAVIORAL AND ELECTROPHYSIOLOGICAL REACTIONS IN ALTERATION OF HETEROGENEOUS
CONDITIONED REFLEXES

Moscow ZHURNAL VYSSHEY NERVNOY DEYATEL'NOSTI IMENI I. P. PAVLOVA in Russian
Vol 30, No 6, Nov-Dec 80 (manuscript received 18 Feb 80) pp 1131-1139

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[Abstract] Experiments were conducted to elucidate the connection between tonic and phasic stimulants and the functional structure of conditioned reflexes; specifically, how altering the significance of a signal for sporadic conditioned stimulation affects the nature of behavioral and electrophysiological responses, and what the specifics are in the somatic, autonomic and electrophysiological components of biologically different conditioned reflexes. Conditioned reflexes in three experimental subjects--dogs with permanently implanted electrodes--were altered from defensive to alimentary and physiological activity was recorded during the process. The findings indicated that the process is accompanied by significant changes in somatic, autonomic and electrophysiological responses. Evoked potentials reflect the changes in the activity of the auditory and somatosensory cortical fields and are most marked in the different amplitudes seen in secondary positive variations. Figures 5; references 21: 9 Russian, 12 Western.
[264-9642]

HUMAN FACTORS

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USING AIRPLANE INSTRUMENT PANEL INFORMATION MODEL TO DETERMINE LEVEL OF PILOT PREPAREDNESS

Moscow VOYENNO-MEDITSINSKIY ZHURNAL in Russian No 2, Feb 81 pp 47-48

[Article by Captain of the Medical Service V. V. Kniga]

[Text] One of the conditions for guaranteeing high pilot performance capacity and flight safety is an objective evaluation of the level of pilot training. The most reliable data can be obtained under conditions that approach the most to the pilot's occupational activity.

The traditional methods require complicated equipment, take a lot of time, and often do not take into consideration such an important aspect as work under conditions of relative time shortage. Creation of a second-signal information model for occupational flight activity, and development on its basis of a technique for quantitative evaluation of the pilot performance capacity (O. P. Yakovlev, 1978) permitted an attempt to solve this problem by psychophysiological methods.

The study task included establishing whether it was possible to determine the level of preparedness of fighter pilots by using a quantitative evaluation of the quality of analysis and synthesis of instrument information. We employed a second-signal information model which reproduced the afferent part of the flight activity, i.e., processes of analysis and synthesis of instrument information. During the testing, the pilots counted the readings of the piloting and navigational instruments, determined the airplane's position in space, and the stage of the flight. This technique permits the subjects to solve occupational tasks, and in this way, permits the physician to evaluate the condition of their nerve processes and individual autonomic indicators.

For the modeling of the flight activity, 47 color slides were made depicting the instrument panel of an airplane making a circular flight. The tests were made during out-patient examination of pilots by the physician flight commission.

In the main version of the studies, each slide was shown for 4 s. The interval between showing of the slides was the same during the entire examination (30 s). Responses of the subjects were recorded in a log according to the developed plan of point evaluation of the quality of analysis and synthesis of instrument information.

A total of 720 slides were shown to 60 pilots. The obtained results were processed with the help of variation statistics.

The quality of analysis and synthesis of instrument information in first class pilots was evaluated depending on the difficulty of the presented problems in limits of 4.1-4.6 points. Their average estimate was 4.4 points, while it was 4.3 for second class pilots (from 4 to 4.6). The difference in evaluations of the first and second class pilots was insignificant and unreliable.

For third class pilots, the average evaluation of quality of the analysis and synthesis of instrument information was 3.9 points (3.7-4.13). The difference in the evaluations of third and first class pilots was significant ($P < 0.05$). In the evaluations of the third and second class pilots it was pronounced to a lesser degree, but was also reliable ($P < 0.05$).

The study results indicate that there is a direct relationship between the quality of analysis and the synthesis of instrument information and the level of pilot preparedness.

One of the most important features of pilots' work is their emotional stress in flight. It is accompanied by more or less pronounced autonomic manifestations. Therefore, a study was made of the functional state of the cardiovascular system and respiratory system of the subjects.

During the modeling of the flight activity in the subjects, the electrocardiogram was recorded, frequency and per-minute volume of respiration were measured. Arterial pressure and state of health of the pilots by the SAN technique were determined before and after the testing (V. A. Doskin et al., 1973).

In pilots of the first and second classes, the R-R interval during flight was reduced on the average by 0.11 s, while in pilots of the third class, by 0.19 s. Heart rate per minute increased in first class pilots on the average by 7.8, second class by 10.1, and third class by 21.7. The difference in the increased heart rate was reliable in the first and third class pilots ($P < 0.05$).

During fulfillment of the occupational task, the phenomena of sinus arrhythmia, if they were recorded before the examination, disappeared. The PQ, QRS and Q-T intervals did not change significantly. The T projection diminished from 3.83 to 3.42 mm ($P < 0.05$). Arterial pressure before and after the study changed slightly. Respiration rate per minute in pilots of varying level of training fluctuated from 10 to 17. The per-minute respiration volume increased in all the subjects. In third class pilots it rose from 6.7 to 8.9 per minute ($P < 0.05$). The state of health of the pilots according to the SAN technique before the testing averaged 5.65 points, and after it, 5.32 points.

Thus, we established statistically reliable differences in the quality of analysis and synthesis of instrument information in pilots of varying level of training. The changes obtained as a result of the study in the cardiovascular and respiratory system assert that the second-signal information model is adequate to the occupational activity of the pilots. The indicators of the electrocardiogram and the per-minute volume of respiration during modeling of flight activity in flight physician expert's consultation can indirectly indicate the level of compensatory potentialities of the body under real flight conditions.

The findings can be used as additional criteria in evaluating pilot training. However, the described method cannot claim independence and absolute reliability, but is only auxiliary in evaluating pilot training. Only commanders and methodologists responsible for occupational training of the flight crew can make a similar evaluation.

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PSYCHOPHYSIOLOGIC CRITERIA FOR OCCUPATIONAL FITNESS OF HEALTHY SUBJECTS FOR CAREERS AS TYPISTS AND STENOGRAPHERS

Moscow GIGIYENA I SANITARIYA in Russian No 6, Jun 81
(manuscript received 23 Sep 80) pp 22-25

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[Abstract] Eighty-one girls, 17 to 19 years of age, were evaluated at Special Professional-Technical School No 121, in Moscow, for suitability for careers as typists or stenographers. Using a variety of psychophysiologic criteria the results indicated that individuals with an aptitude for such occupations should exhibit excitatory mobility of at least 220 sec, a minimum value of 1.5 Hz for the updated R. L. Rabinovich's bimanual work test, achievement of at least 4 arbitrary units on the tapping test, and an attention switchover time of less than 125 sec. References 6 (Russian).
[306-1 172

UDC 331.015.11:62.004.12.001.4

MODEL FOR COMPLEX ERGONOMIC PRODUCT EVALUATION

Moscow TEKHNICHESKAYA ESTETIKA in Russian No 4, Apr 81
(manuscript received 22 Aug 79) pp 26-27

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[Abstract] A functional model is described for complex ergonomic analysis of product quality in manufacture of articles. Quantitative expressions are derived to calculate the level that optimum indicators are achieved in the analysis and the level of differentiation in the ergonomic indicators of the

article. The model is applicable to analyzing the quality of agricultural equipment during state trials. The model can be applied both to Soviet and worldwide standards of product quality. References 8 (Russian).
[235-6521]

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